

REMARKS

Rejections Under 35 USC §103

Claims 25, 26, 28-33, 35-37, 39, 47, 46 and 51-53 have been rejected under 35 USC §103(a) as being unpatentable over Chou et al. (US Patent No. 5,691,568).

Claims 27 and 34 have been rejected under 35 USC §103(a) as being unpatentable over Chou et al. (US Patent No. 5,691,568) in view of Pedder (US Patent No. 5,717,245).

Claim 38 has been rejected under 35 USC §103(a) as being unpatentable over Chou et al. (US Patent No. 5,691,568) in view of Beaman et al. (US Patent No. 5,531,022).

Claims 49 and 50 have been rejected under 35 USC §103(a) as being unpatentable over Chou et al. (US Patent No. 5,691,568) in view of Rostoker et al. (US Patent No. 6,181,011).

The rejections under 35 USC §103 are traversed for the reasons to follow.

Summary of the Invention

Claims 25-39 and 47-53 are directed to a "semiconductor component". The component includes a substrate 10 (Figure 2), and a conductive layer 14 (Figure 2) substantially covering a surface of the substrate 10. In addition, the component includes conductors 16 (Figure 2) on the surface, and a semiconductor die 20 (Figure 2E, 3A or 7) in electrical communication with the conductors 16. Each conductor 16 is defined by a pair of grooves 15 (Figure 2) which comprise ablated portions of the conductive layer 14. As shown in Figure 2C, the conductors 16 comprise portions of the conductive layer 14 separated

by the grooves 15, and by remaining portions of the conductive layer 14 having edges defined by the grooves 15.

35 USC §103 Rejections over Chou et al.

The 35 USC §103 rejections over Chou et al. and Rostoker et al. are traversed as Rostoker et al. has an effective date of December 29, 1998, which is after the July 6, 1998 priority date of the present application. In this regard, the present application is a continuation of serial no. 09/110,232, Patent No. 6,107,109, filed on July 6, 1998.

Each of the independent claims, and most of the dependent claims, have been amended to emphasize features of the component which are not disclosed or suggested by Chou et al. alone, or Chou et al. in combination with the secondary references. A first distinguishing feature of the component recited in each independent claim is a "conductive layer having a selected thickness substantially covering the surface configured to provide a material for forming elements of the component by laser machining". Antecedent basis for the "selected thickness" recitation is contained on page 9, lines 15-17 of the specification.

The Examiner has dismissed the significance of this limitation by stating: "forming the elements do not distinguish over Chou et al. because only the final product/structure is relevant, not the process of forming the elements". However, the limitation describes a physical feature of the component (i.e., it's adaptability to laser machining) rather than it's method of formation. If a product has features which facilitate manufacture, patentability can reside in the product rather than the method of manufacture.

As stated in In re Morosi, 710 F.2d 799,218 USPQ 289 (June 22, 1983), which was cited in the Office Action: "Where a product-by-process claim is rejected over a prior art product that appears to be identical, although produced by a different process, the burden is upon the applicants to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product."

Applicant submits that the present conductive layer configured for laser machining is an unobvious difference over the prior art. In Chou et al. there is no disclosure that the land segments 1011a-d (Figure 10A) and traces 512 (Figure 10A) comprise a layer of metal substantially covering a surface having a thickness selected for laser machining. Rather, as shown in Figure 10B of Chou et al., the land segments 1011a-d and traces 512 do not substantially cover the surface of the assembly 1000, and may not be a material with a thickness selected for laser machining.

Dependent claims 28 and 31 narrow the description of the conductive layer further by stating "the metal comprises copper and the selected thickness is about 18 μm ". Antecedent basis for this recitation is contained on page 10, lines 24-28 of the specification.

A second distinguishing feature of the component is a conductive layer 14 having portions which form the conductors 16, and portions which separate the conductors 16. The component also includes grooves 15 through the conductive layer 14, which define the size and shape of the conductors 16 and the second portions. Each of the independent claims include recitations which define the feature of the conductor forming "portions" and separating

"remaining portions" of the laser machineable "conductive layer". One advantage of this construction is heat dissipation and rigidity are provided by the remaining portions of the conductive layer 14. Another advantage is that a laser machining process can be used on the conductive layer to accurately form the grooves 15 and the conductors 16 with widths as small as about 5 μm .

The Examiner has cited the grounded die paddle 1180 (Figure 11A) in Chou et al. as anticipating the "remaining portions" feature. However, in the present case the "remaining portions" are the primary constituent of a conductive layer which "substantially covers the surface" of the substrate. This is not the case with the die paddle 1180 in Chou et al. which covers only a small portion of the assembly 1100.

In addition, the present "remaining portions" perform no electrical function, as with the grounded die paddle 1180 in Chou et al. In order to emphasize this difference amended independent claims 25, 30, 35 and 52 state that the portions are "configured for electrical transmission" and the remaining portions are "configured for no electrical transmission". Antecedent basis for these recitations is contained on page 9, lines 1-6 of the specification, which discusses the electrical function of the conductors 16 and contact pads 22 "which are separated by portions of the conductive layer".

Another distinguishing feature of the present component is that the geometry and the size of the conductors is determined by the grooves. This feature allows the geometry to be small and dimensionally accurate, because the conductors and grooves are small and accurately formed. For example, independent claim 30 recites "a

plurality of grooves in the conductive layer defining sizes and shapes of the conductors and the remaining portions, each groove having a width as small as about 5 μm ". Antecedent basis for this recitation is contained on page 9, lines 12-13 of the specification. Independent claim 25 recites "each groove defining a shape of a conductor and an adjacent second portion". Neither of the above recitations reads on the assembly 1000 (Figures 10A-10B) or the assembly 1100 (Figures 11A-11B) of Chou et al.

Another distinguishing feature of the present component is that the geometry of the conductors can be controlled to achieve a desired impedance. As stated in independent claim 52 and dependent claims 29 and 48: "with a thickness of the conductive layer and a size and spacing of the conductors selected to provide a desired impedance value for the conductors". Antecedent basis for this recitation is contained on page 9, lines 15-27 of the specification. The prior art does not disclose this feature in combination with the above described features of the component.

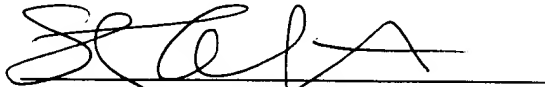
In assessing unobviousness the Examiner is asked to consider the above noted differences between the prior art and the claims "taken as a whole". In the present component there is a new and unobvious laser machineable "conductive layer" having "portions" which form the conductors, and "remaining portions" which separate the conductors. In addition, there are "grooves" which form the "conductors" and "remaining portions" with a new and unobvious geometry. Further all of these features are recited in combination and do not stand alone.

Conclusion

In view of the amendments and arguments, favorable consideration and allowance of claims 25-39 and 47-53 is requested. Should any issues remain, the Examiner is asked to contact the undersigned by telephone.

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Respectfully submitted:



STEPHEN A. GRATTON
Registration No. 28,418
Attorney for Applicants

2764 S. Braun Way
Lakewood, CO 80228
Telephone: (303) 989-6353
FAX (303) 989-6538

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Stephen A. Gratton
Attorney for Applicant